

TECHNOLOGY DEPT.

PUBLIC LIBRARY

NOV 17 1939

DETROIT

The Journal of the

INSTITUTION OF PRODUCTION ENGINEERS



Vol. XVIII

No. 10

OCTOBER, 1939

CONTENTS

	Page
THE POSITION OF THE FOREMAN IN THE ORGANISATION, by James Wright, M.I.P., with report of Discussion, Glasgow Section	397
FIFTEENTH ANNUAL DINNER	420
PRODUCTION ENGINEERING ABSTRACTS	CX

All rights reserved

Published Monthly by The Institution of Production Engineers.

36 Portman Square, London, W.1.

Telephone : Welbeck 2233

Price 5/-

EX-CELL-O TOOL GRINDER

For High Speed Cutting Alloys



BC490

Using Diamond-impregnated Wheels this machine provides the fastest means of grinding tools tipped with modern high speed cutting alloys. Two wheels—one roughing and one finishing reduce the sharpening time to a fraction of that required by former methods.

IMMEDIATE DELIVERY

BURTON, GRIFFITHS & Co. Ltd.

SPARKBROOK — BIRMINGHAM 11

Branches: LONDON - MANCHESTER - LEEDS - BRISTOL - GLASGOW - BELFAST

THE POSITION OF THE FOREMAN IN THE ORGANISATION

Paper presented to the Institution, Glasgow Section

by James Wright, M.I.P.E.

IN preparing this paper, I must confess that I was bewildered at times, because the subject generally is lacking in real substance, and the title foreman is used in different parts of the country to indicate the position of so many individuals whose responsibilities may vary from the charge of a small group of workers to the shop manager of a large factory. To merely state that a man is a foreman is insufficient to define his duties, unless associated with some particular territory in the factory or qualified in a manner which leaves no doubt in the mind regarding the scope of his activities. Since the word foreman means first or chief man, it seems unfortunate that we should have to discuss the holder of that title or that his position in the organisation should even be in doubt.

I presume that the title of this paper was first prompted by the knowledge that recent developments in works supervision has sapped so much of the authority previously held by the foreman, that in many factories to-day he is merely a figurehead controlling discipline, instead of managements' sole representative in the shops.

Before proceeding further, I must admit almost complete failure to solicit any constructive matter from various executives on this subject, my efforts usually ending up with a local story in many cases not suitable for print.

In a talk with one or two representative foremen, however, I have gathered that the rapidly changing conditions which are constantly developing in our works and have been for the past generation, has caused newcomers with new and extravagant titles to encroach on what was previously the responsibility and domain of the old-time foreman. I am referring to planning and efficiency engineers, ratefixers, and time and motion study men, process and progress engineers, etc.

The pace with which these changes have been brought about has been such that, up till now, very little serious thought appears to have been devoted to the effect that this undermining of the personal structure has had upon the foreman, his influence, his

position in the organisation, and what is more important still, his prospects for the future.

Since most members of this Institution are involved in the changes which have taken place, it is naturally their concern to help to clarify any set of circumstances which may have arisen from those changes.

By selecting this subject for discussion, it is apparent that our members wish to air the matter and I hope that we, as a body, may contribute some viewpoints which will help to define, if not re-establish, the position of the foreman and help thereby to eliminate some of the irritation which has prevailed in recent years.

If this subject is to be cleared up, it will not do in future to take the matter for granted, as we have done in the past, but on the contrary, it may be profitable to consider the voice of the workshop a little more, with special reference to the key man who run it. We must not be unmindful of his difficulties, nor forget the type of person he is constantly dealing with and the pitfalls and temptations he must be subjected to by that contact. It must be borne in mind that he reflects to the workers the type of mind possessed by management. He must be appreciated as the man who does things whilst others only talk, and as such is entitled to have the confidence of higher management and know something of their policy.

Some of you may disagree with the angle of attack which I am taking, but I have endeavoured to visualise the point of view of the average foreman in the average works to-day, and of course, I hope my statements are of a sufficiently controversial nature to create a healthy discussion when I am finished.

In a lecture on "Some aspects of management" however, our ex-President stated that "in many trades a foreman, with assistants, can control from 30 to 40 operatives." I quote these figures because I believe they are fairly representative of the average factory or workshop. It must be remembered that 85% of British factories employ less than 50 persons.

Whether a company is large or small, there seems to be a common viewpoint regarding the vital importance of the foreman's position, but progress in industry has brought with it changes in the responsibility of individuals which appear to have relegated the foreman and widened the gap between himself and the higher management or executives.

To illustrate this I propose to quote a typical case related to me by the foreman concerned. A company employing 40 to 50 workers, thirty years ago, had as the management group a general manager, who was 75% commercial, a secretary-cum-cashier, and the owner. Our friend, the foreman of the works, whose authority therein was supreme, was the only other executive. He was responsible for

THE POSITION OF THE FOREMAN IN THE ORGANISATION

every phase of production, discipline, safety, cleanliness, training of apprentices, and the loyalty of the workers. In that position he commanded the full respect of everyone, and his influence coupled with his ability were responsible for the smooth running of the works and the success of the concern generally.

Under these conditions the business flourished to such an extent that plant had to be duplicated or replaced to meet the demands, and of course in the process of expansion, some of the foreman's previous duties had to be delegated to specialists, men who were highly trained in one branch only of the work formerly handled by the foreman. These specialists were the newcomers, whom I have already named, and the usual departments were set up to assist in the organisation of production on a larger scale than hitherto.

There was no question of the ability or qualifications of each new man in his own particular sphere, although at this stage it was emphasised how dependent upon the foreman each one was for information, and how the foreman's intimate knowledge of all matters concerning the works was recognised and appreciated.

Ultimately, by co-operation, the factory production was planned on lines generally known to-day as scientific. So far so good, and no one will argue against the principles involved. It was quite the logical and proper action to take to increase the staff in proportion to the turnover and quite in keeping with fashion to have a planning department and all its trimmings.

The management of that company took the only course open to them, because it is doubtful whether any other means would have achieved their object of meeting the growing demands for their product.

To-night, however, I am talking to you in an effort to place the foreman in his right and proper position in the organisation, and the point is that the influx of those additional executives had not only inclined to take away some of the duties which had previously been carried out by our friend the foreman, but in the process they weakened his authority, and partly destroyed the confidence and respect which he had commanded from the workers. They not only trespassed on his former domain, but had assumed a superiority and capitalised it. Progress had changed the policy of that company and brought with it a larger staff. The occupants of the newer positions were elevated in the organisation chart to the more prominent places than their ability warranted, varying from somewhere below the works manager to somewhere above the foreman. They, furthermore, had shorter hours of work, superior accommodation and, in most instances, privileges and holidays not enjoyed by the foreman.

From his point of view, and after all, that is partly what we are concerned with tonight, therein lies the tragedy of the whole affair. He felt that, by granting special rights to these people, management had forsaken him and the workshop, for the intermediate departments, and abandoned the close contact and intercourse to which he had been accustomed and which were essentials to a man of his intellect.

It would be difficult to assess the value of personal contact between foreman and higher management, but there is no doubt that if that tie is severed or even weakened, the mutual understanding and confidence are effected to a similar degree.

Let us study for a while the position of that particular foreman in the new organisation.

His responsibilities were similar so far as the actual product was concerned, and after all, the production is the life blood of any factory, and it represents the only source of revenue to the company. Its importance must not be overlooked nor underestimated. It is the only saleable article in the concern, and he is still solely responsible for both quantity and quality.

It can be argued that the foreman's burden has been lightened in some respects by planning, fixing rates, making special fixtures etc., but to counter any benefits, he now meets problems hitherto unknown to him, namely, the demands imposed on his machines and men by people with only a superficial knowledge of the capabilities of these two very important factors. Furthermore, we must remember that the new conditions are bound up in some new system or other, which in many cases demands concentrated attention and occupies many hours of the foreman's time to ensure success. We must agree that to regularise the flow of production, some form of system is essential, but system does not always spell efficiency and is inclined to make the foreman into a clerk. It is an unfortunate fact that rarely is the foreman consulted when system is being instituted. In addition to the product, he is still wholly responsible for discipline, safety, cleanliness, training of apprentices, and loyalty of the workers.

In other words, it is only the volume of work that has really changed, not his responsibilities. Why then has he lost some of his former authority and been relegated to a position wherein he is out of contact with higher management. This, in turn, has the effect of narrowing his general outlook and if not checked will result in complete demoralisation. Now that was not the intention of the management, nor was it to be in the scheme of things that the man responsible for the workshop should be deprived of any of his former authority. Had that been even suggested I am sure that steps would have been taken to balance the power of each individual

working on the executive staff of that company. Notwithstanding, it is no doubt this state of affairs which is causing technical journals and institutions to take a live interest in the foreman's position and concern themselves with his future. They are realising that in the last generation we have been so keen to become scientific that the all important position of foreman has run to seed through neglect.

What then is to be done to stop the rot and re-establish the holder of that title. Having satisfied ourselves that a man qualified to hold the position of "first man in the workshop" is worthy of more consideration in future, it may be necessary and advisable to analyse the duties and responsibilities of all executives, place a true value on their relationship to production, and allocate executive authority and position according to their worth to the company.

It is not within the scope of this paper to deal with the duties of each executive in detail, but we must give some consideration to their main functions before we can place a value on the foreman. Furthermore, we must indicate the type of person required to fill the various positions, the qualifications necessary and the facilities available for acquiring suitable training.

I realise what a controversial point is raised by suggesting that we can place a true relative value on individuals holding positions which are incomparable in nature, but I do it deliberately because I know of no other means of deciding the point raised by the title of this paper. One reason why this is a controversial point is that to-day there appears to be a wrong sense of values placed upon individuals connected with industry and one is led to the conclusion reluctantly, but surely, that so far as actual production is concerned, the more detached the position, the more that person's opinion is respected, and consulted by the higher management.

Such persons are not always possessed of executive ability, but they are endowed with executive authority, and are permitted to determine issues concerning production, which undoubtedly should come within the province of the foreman who is more qualified to give judgment on points pertaining to the workshop. The foreman's opinion should be sought or expressed on all manufacturing problems, his word should be second to none. Almost daily we see conditions imposed on men and machines which are impracticable. Why?

It is suggested that we are suffering from a mild form of technocracy, an Americanism perhaps, but quite an apt word. When I say suffering, I mean that the healthy co-operative atmosphere which breeds efficiency in a factory is undermined by an overdose of management by 100% technicians. The effect is that the practically-minded man (the foreman) withholds his contribution until he is able to reveal some major mistakes, and then delights in putting

the whole matter right in a manner which compares with the conjurer taking the rabbit from a hat. From management's point of view, this attitude of the foreman is sometimes misinterpreted as holding something up his sleeve, but such is not always the case. There is some information which cannot readily be tabulated, because there are too many variables. The only way a company can benefit by all the available knowledge is to encourage those in possession to impart that knowledge. The foreman, by virtue of his position is bound to be well informed regarding shop difficulties and the most economical method of overcoming them. Such information is priceless and should be recognised as such. It would be made available voluntarily, provided the foreman was consulted and made to feel that he was in the scheme of things.

There is, in engineering, a scientific approach to every problem, and even though management is not a science, it is possible to draw a line around each executive position, define its borders, and to confer upon its holders complete authority for carrying out the specific duties involved. There is, perhaps, one exception, and that is the foreman. Care should be taken, in his case, not to limit his scope to such an extent that initiative is cramped. We must remember that whereas the planning department cannot manufacture, but only lay out the plans of others, the foreman can and does do both. He is not, nor should he be 100% technical in his outlook, and therefore is not trained like the technician to deal in facts and figures only, whereby fixed reactions occur, but is dealing with human beings, machine and workshop operatives who, whether skilled or unskilled, have no exact properties and therefore must be controlled and understood by someone with a more fertile and flexible type of mind than that usually possessed by the pure technician.

Such details should be borne in mind when assessing the value of a man, because the ability to control labour is a possession which cannot be learned from text books. In addition to this gift, the foreman's training should have been well balanced with perhaps a slight tendency in favour of practical work, for to be successful, he must have a good working knowledge of all processes over which he has control. He must, furthermore, be prepared to solve those difficulties which arise almost daily and yet which cannot be allowed for in any planning system so far evolved.

Furthering our effort to place a value on the various executives and to illustrate my last point, it may be advisable to quote a typical case, starting from the receipt of an order, in which I hope to indicate the complex nature of the foreman's task in relation to those who plan and prepare the work for him to execute. An order is received, material ordered to specification, operations planned, rates fixed, tools and gauges designed, etc. The persons concerned in these processes merely apply whatever systems are in vogue,

work out details according to fixed formula, and plan from information already available. The work is mainly of a semi-clerical nature, the accumulation of data being only a matter of time with an occasional reference to a text book. With the exception of entirely new products, planning in most works resolves itself into the transferring of information from master record cards and committing to paper the instructions necessary for the work to proceed as economically as is known in that particular factory, assuming materials, men, machines, and money to be available. Rate-fixing is a similar process, for machining times and rates of pay are so standardised that for the most part calculations are already worked out and have become stereotyped. In both cases there is always the safety factor that errors may be found out and corrected in the shops before serious trouble could occur.

The design of tools, fixtures, and gauges, is probably the outstanding item which so far calls for a really highly developed and capable executive to consider, although it is the custom in most factories for the foreman to be called upon to sign on the dotted line, before a conclusion is reached or a design finally approved. You see the irony of the situation, there is a grave danger of error arising here which may result in costly methods or scrap parts, so the foreman must share the risk. Ultimately, the work is ready to proceed to the shops and the progress department issue material and instructions to the foreman with emphasis on the final delivery date, which, of course, is their one and only concern.

It should be the foreman's duty to assign the various parts to workmen in whom he can place trust to perform the operations in a satisfactory manner and in accordance with all the specifications laid out for him in advance by the planners.

For successful and economic production the foreman should know in detail the personal ability of each workman, and should have complete freedom to use the labour to best advantage. Unfortunately, he is not allowed to use this valuable knowledge, for that due date often compels him to distribute the work in a manner foreign to his own ideas, hence he starts off with a handicap. Having reluctantly given the jobs to B instead of A, he finds that the material is not cutting according to the specified speeds and feeds, two or three important and expensive tools decide to break before the batch is half completed, and the suds pump on the machine suddenly refuses to function. Such a case is not uncommon, and every foreman has to deal with such problems almost daily. What does a foreman do in these circumstances? He cannot refer to a text book, none deal with such matters. It is useless to consult the planning department; they might sympathise of course, but cannot help, and in workshop practice there is no button "B" to press on such occasions. He must quietly, quickly, and effectively put

these matters right, in a way which only a good foreman can do, endeavour to make up some of the lost time, and thereby keep his due date. At the same time he must placate the worker on account of lost wages.

I do not suggest that such occurrences are due to carelessness on the part of any member of the organisation, nor can they be foreseen and thereby avoided, but I am merely illustrating the vast difference between the duties, responsibilities, and importance of the various executives, whereby we might assess them at their proper relative value and arrive at some solution to that elusive point "What is the position of the foreman in the organisation?"

A fundamental difference between the planning side and the actual production side of a business is that, in the former, figures and data are tabulated and transferred to cards or forms on which errors can be erased or revealed without serious expense being incurred, whereas in the latter, material is being transformed into the finished product and has a real money value. A mistake at this stage may result in financial loss and injury to the reputation of the company. This is point number two to be remembered when placing a value on the foreman's responsibilities in relation to other executives.

From the foregoing, you will appreciate that in the process of modernising the administrative side of engineering businesses, there has naturally been a tendency to concentrate on the newer positions which have been created and neglect those which were already established. We can also assume that the time has arrived for serious thought to be given to the subject matter of this paper. What then of the future. It may be that some new title or titles will have to be evolved for what remains of the old-time foreman, those men whose duties have been segregated and handed out to the newer executives previously mentioned. If it is the wish of higher management to have mere supervisors mechanically giving orders in the shops in accordance with pre-planned schedules, then the name of foreman should be dropped, because it would be a mis-nomer.

On the other hand, assuming the title is retained, I believe that there is now commencing a new era for those qualified and capable of controlling the workshops of the future because we have apparently reached a turning point where it is recognised that we have mechanised, centralised, rationalised, and standardised most things, but that human nature still remains unchanged, and that a manager, after all, wants the job, not the job card. He now realises that the best man to give and keep a promise is the man nearest to the actual production line.

The position of foreman demands a standard of education rather different from the average executive. When I use the word educa-

tion I mean it to apply in the broadest sense and principally to the post-school years. To successfully advise, instruct, and control workers he should possess a fund of knowledge which can only be obtained by practical experience in different workshops, where difficulties are encountered and overcome in a variety of ways. He must mix with people and understand the different types. The training and selection of foremen, however, may be worthy of more careful study in future, due to the changed order of things. A different mentality is required, he must aspire to be something higher up the ladder, he must have the capacity to combat the efforts of others to belittle his position, he must be worthy of his title and be able to live up to its meaning, "the first man" in the workshop. There is still scope for authors of technical books. The numerous and immeasurable nature of the foreman's problems is no doubt responsible for the lack of written matter on the subject, coupled with a very wide field and a big demand in the past for literature on higher or scientific administration. It is a matter for regret that that part of the factory where money is earned, not spent, has been so sadly neglected in that respect.

Book learning will not, of course, alter the blood stream, and is useless unless primarily there is the inherent desire for leadership, the first and most important qualification for a foreman. Leadership is not hereditary and cannot be taught. It must be present in sufficient quantities to overcome all the difficulties which I have mentioned, and is in itself the one characteristic which reveals a suitable client for promotion. If you add to the leadership qualification a fund of common sense you have 90% of the mixture necessary, the remaining 10% may be gathered from books on management subjects, with special reference to factory organisation, works planning, costing, systems, labour control, time and motion study, factory safety, and welfare work. The specific books to read will depend upon the students' aspirations, but it is well to remember that a good knowledge of administrative subjects cancels out weaknesses in other directions.

The duties of a foreman in the average works could be summarised as follows :

- (a) To convert the ideas of the designer, planning department, and management into the finished product, using the material, machines and men available, by the quickest and cheapest way consistent with the standard of quality demanded by the customer.
- (b) To interpret accurately the mind of the management when dealing with workers and be sufficiently discreet and tactful to prevent misunderstanding, friction, and consequent labour troubles.

- (c) He must have a good working knowledge of the product, all machines, and methods of manufacture, and be able to instruct the worker, demand results, and command respect. True leadership produces results which are unobtainable by driving tactics.
- (d) He should teach loyalty and only promise what he can fulfil. He must bear in mind that, although sometimes more difficult, there is much more satisfaction in guiding a worker to his own particular way of thinking, rather than to dispense with his services in a moment of haste.
- (e) Teach cleanliness in all its aspects.
- (f) Retain a keen interest in the welfare of the worker and employer.
- (g) Be fair and impartial in all dealings and insist on hearing both sides of a story before giving a decision.
- (h) Keep himself acquainted with new ideas and types of machines introduced, as advertised in trade journals.
- (i) To be able to control the workers in the broadest sense of the word, and maintain a contented force of producers.
- (j) Translate theory into practice.

To fulfil all those duties successfully may seem outwith the capabilities of the average foreman to-day and yet anything less should be unworthy of the title. If we are going to recognize that the position of the foreman in the organisation needs to be more clearly defined in future, then we must, by some process of elimination, only retain that title for persons who are fully equipped to be the personal symbol of management in the workshop.

Those foremen who have lost some of their former eminence as a result of changes in their organisations, belong to the past, and we need not dwell on such cases.

At present, we are still at the transitional stage, and are only just beginning to realise that the word foreman is used in too wide and too general a sense. Almost every technical journal we read to-day is contributing an article or two in the furtherance of the foreman's position.

We can look forward, we hope, with confidence to the time when foremen will be properly selected and fully qualified by their education, experience, and ability to be the "first man" in the workshop, a credit to and reflecting the type of mind possessed by higher management, when he will no longer feel that inferiority which in the past has permitted others to encroach upon his prerogative, and when management will return to the ideal that the workshop is the hub to which everything else must be subservient. Then perhaps non-productive and service departments will be measured

THE POSITION OF THE FOREMAN IN THE ORGANISATION

only by their usefulness to production and retained only as long as they serve that purpose. The foreman's position in the organisation will then be no longer the subject for discussion by technical societies, but will be established in a manner commensurate with his onerous duties.

Discussion.

MR. LANG (Section President): You will agree that we have had a very interesting lecture from Mr. Wright, and one which is going to give considerable scope for discussion. I think with Mr. Wright that there is a definite reaction from what we might call the "mechanised age". Management is realising that there is a human side to the control of a workshop, which was being rather lost sight of, and I think there is at the moment a definite reaction in which the foreman is going to play a part. Human nature is a variable and always will be, and the science of managing human nature is one that, as Mr. Wright says, is inborn. For that reason alone, if for no other, I think the foreman will again come into his own. I am sure many of you have something to say, and the meeting is therefore now open for discussion.

MR. MALLETT: It is very difficult to continue a discussion of this kind without having some basis upon which to work. Mr. Wright began his lecture on the right lines when he spoke of the foreman as controlling men, and he finished his lecture on the right note when he described the qualities of the foreman. I would like to deal with his example of the foreman who became disgruntled. In this particular works there were three people above the foreman who practically ran the works. Then the works grew, and the machines were duplicated. Assuming Mr. Wright really means duplicated—that is to say that they were only doubled—I do not see why all the other departments were needed. He probably only needed assistance. The first man he needed was an inspector, because one of the worries of the foreman is to know whether the job is being done properly, and if that were taken off his shoulders and he had been kept in touch by an inspector, that might have constituted sufficient assistance to start with. If, on the other hand, Mr. Wright meant that the firm grew beyond the doubling stage and got larger and larger, then these other departments were necessary. The whole crux of the situation is that the people at the top were to blame because that foreman, if he had the intellect (and Mr. Wright mentioned that he was a man of high intellect) should have gone up the scale and become superintendent and eventually works manager. He was virtually works manager of the small works, and if he had the right intellect to rise as the firm rose, then he should have been promoted to the higher post. The thing to blame was not the position of the foreman or the name of foreman, but the people who decided to keep him as a foreman. Further on, Mr. Wright made the point that in many cases the foreman becomes a

clerk. Well, I have perhaps been fortunate because in most places I have encountered, the man has not become a clerk. The other departments have taken away clerical work from the foreman and left him more closely in touch with the machine than ever he was before, which is the right outlet for the foreman, and the right way to use his energies. Further on, Mr. Wright brought in a second example, and criticized to a certain extent planning departments which only work from books. They should not work only from books, of course, they should be practical men also. In many cases planners actually can be brought in from the foreman grade. Planning properly carried out does not run on fixed lines according to a system. It starts right from the drawing, by deciding what we are going to make the part from, whether it should be made from a stamping, or from bar, or from a pressing, etc., and in a great many cases the ordinary foreman here as we know him—I must use the word ordinary foreman here—could not rise to that. He does not know enough to be able to decide that : it requires somebody with a more technical training, plus the practical knowledge. In order to discuss the foreman, we should put the question upon a basis of the size of works, and so have a better idea of what we are discussing. As Mr. Lang pointed out, in some places we are losing to a certain extent the great help which the foreman can give. Works *have* been oversystematised, and the foreman is not so frequently consulted. The tendency is the other way. The *real* planning department is made up of men who in many cases could actually go out and do the foreman's job, if the foreman were ill, and who possess in addition those technical qualifications which help them to do clerical work, if you like to call it that—I prefer to call it technical guidance—which once recorded is there for the future. It is there when the next job comes along, and has not to be thought out every time, as so often is the case when the foreman relies on his memory. With an organisation of that sort the foreman is left free to concentrate on the desirable feature of keeping closely in contact with the men and machines. Even our present method of controlling disputes and dealing with men still leaves him in the position that the shop steward approaches him first, and I think most foremen do realise that side of the question.

MR. WRIGHT : Mr. Mallett mentioned the first instance I gave and said that the foreman should, had he been qualified, have become the works manager. Well, I quite agree, I have never disputed that. The point I made in my paper was that he *did not* become the manager. I did not state whether he was qualified or not for the managership, but my point was that the firm grew, and the plant was changed to suit the higher production required, sometimes machines were duplicated, sometimes replaced by more modern machines and by different methods. The fact that the

firm introduced new people for the new functions took the mind of the management off the foreman, and the management so concentrated on these new people that the foreman was lost for the time being. For a period he was never in consultation with the management, it was all done through these intermediates. That was the point I wanted to make, and that is the point I will keep to. The management, this is a real instance, in that case did not go near the foreman during the process of the change-over, and they gave their attention to the newcomers, probably by virtue of the fact that there was nothing to go to the shops for. There was a whole time job for them in dealing with these new people, and these people, by virtue of their contact with the management, made capital out of it and assumed authority, and ultimately got it. That was over a long period, of course. It is unfortunate that the foreman did not become manager, but that is the whole crux of the situation, that is where the disgruntled foreman comes in.

As to the second question of the foreman becoming a clerk, I mentioned that in connection with system. I cannot quote individual cases because it is not desirable—we are generalising—and I say that these new methods and the change-over that took place introduced a system of some sort which in many cases caused the foreman to fill in forms and sign things he had not been accustomed to in the past, and that is what I mean when I say that it tends to make the foreman into a clerk, and I adhere to that. There are many cases in which a foreman spends a great part of his time either signing notes or filling in forms and making reports on various matters for his different executives.

With regard to the question of the planner, I take it that you claim that the planner is a superior man in so far as his technical ability, plus his practical ability, is superior to that of the foreman. Well, I doubt whether that is so in many cases, but assuming that the planner is superior it is no reason why the foreman should be so neglected, it is no reason why, because the planner has some superior specialised knowledge, he should be considered higher up the executive tree than the foreman. So far as a works organisation is concerned, the foreman should be as high as anybody who is connected with the actual production or the laying-out of work. It was suggested that the planner could do the foreman's job whereas the foreman could not do the planner's job. The chief planner is, as a rule, looked upon as some superman brought in from the outside. My opinion is that the planner may have a slightly superior technical knowledge than the foreman, but that does not make him a more important being in the organisation.

Coming back to the question of the planners and the suggestion that they work from books, that is very true. 90% of planning is working from books, it is repeating something that has been

done before. If not an exact copy of it, then the basis of a new job is usually to be found in the records of any planning department. Most planning is done from information already available, and that does make it a semi clerical job.

MR. RANDLE: The lecturer took the part of a "disgruntled foreman." I can only say, as a manager, that I would be a very disgruntled manager if all my foremen had a similar attitude of mind, because it is one of the rules of psychology that a man can be unhappy in two ways—if he has not got a job that is big enough for him and, secondly, if he has a job which is too big for him. Obviously, all these foremen, trained up to the (W)right specification, are too good for their jobs, and I am afraid that in addition to the foreman being disgruntled, the manager would be disgruntled also. But I think the problem is one of organisation, as Mr. Mallett has said. We will take Mr. Wright's figure that a foreman can, without assistance, look after 30 operators. In order to get away from the difficulty of Mr. Wright's definition of the foreman as the first man in the works, I would like to call that man a section leader in charge of roughly thirty men. I find usually that it needs what I will call a general foreman in charge of these section leaders, and the general foreman usually comes in at about the 200-250 employees mark. In works of about 1,000 there is usually beyond the general foreman a works superintendent or, if the firm is no larger than that, a manager. It is only when it gets beyond 200-250 that the question of a big planning organisation comes in. The question then arises, what is each section leader, or the general foreman, or the works superintendent, or the manager responsible for. There are many things which the foreman in some works are expected to do to-day. For example, inspection, rate-fixing, machine maintenance, training of apprentices, the distribution of material to the machines, the planning to use the existing tools and fixtures, and the planning of new fixtures. Now I maintain, Mr. Chairman, that one foreman cannot possibly handle that, and the only way to get true satisfaction is to delegate the work. I suggest that the section leader in charge of about 30 operators has enough to do to handle those men, see that all the machines are working, adjust any difficulties which arise, such as a damaged suds pump, which might be done with the help of the plant maintenance department, and see to the tidiness of the shop. Beyond that he should not have any direct responsibility. My experience is that a foreman who is responsible for the rate fixing is in the end a liability rather than an asset. I find that favouritism comes in, and I hold strongly that a section leader directly giving out the work to the men should not be responsible for rate fixing, and that similarly he should not be responsible for inspection. Some of this work should not even be given to the general foreman. I suggest that the general foreman's job is to co-ordinate his section

leaders with the help of the other departments, and the main departments that I outlined, such as rate-fixing and plant maintenance, should be directly responsible to the manager or, if it is a small works of about 1,000, to a works superintendent. I am bound to speak of the works superintendent because of Mr. Wright's definition of the foreman as the first man. If you consider that that works superintendent is the first man, I would say that only in the case of a big organisation should he deal with still another thing, such as cost control and take full responsibility for that, dealing himself with the various general foremen and, if necessary with the section leaders. I would like to hear Mr. Wright's opinion of that because it seems to me to be a matter of organisation and of the levels of responsibility you are going to put at the different levels which I have suggested.

I think that one of the difficulties of the firm which Mr. Wright mentioned was that they had to change from a small firm organisation to a large firm organisation when the number of employees really did not justify it, and that is a great difficulty. Beyond a certain stage the old methods of working do not pay and yet there is not quite sufficient to justify going into things on a big scale. One other point Mr. Wright made was that there was a lack of technical writing on foremanship, and that is perfectly logical because if every foreman had to deal with what Mr. Wright suggested he should deal with and be familiar with it, he would have no time to write anything, not even personal correspondence. You will notice, however, quite a lot of books on management, written by those people who, being freed from being directly responsible, have some time to think and to put their thoughts on paper.

MR. WRIGHT: On the first point I quite agree with Mr. Randle, that jobs should be allocated to various individuals. I have never claimed that foremen should be responsible for rate-fixing. It is not a question of whether the foreman should do his own rate-fixing or not, it is a question of whether, when you have allocated those various duties to different individuals, should the foreman lose some of his former authority or should the foreman be relegated as a result of some of his duties being transferred to other people. Does the fact that the rate-fixing and planning are being done by other people mean that the foreman is any less important? I do not want you to get the impression that I think the foreman should be superior in any way to these other individuals, any more than I think they should be superior to him. A balance of power should have been instituted rather than what has actually happened. That is, these people who have taken over the duties have been elevated to higher positions in the organisation and looked upon by higher management more favourably. I agree that the duties should be distributed, but the point I have tried to make is that the foreman's

position should not be diminished because, with the higher production, the foreman still has equal responsibilities.

The next point mentioned was the chargehand, foreman, general foreman, superintendent, and so on. I quite agree that a man may be called a chargehand if he is over only 20 people, and foreman if he is in charge of men up to, say, a 100, and so on, but I do not think we can do anything to define the titles.

We have to recognize the word foreman as the title of a person capable of being the first men in the shop, irrespective of its size, and we must find new titles for those people who are under him and yet in authority. But the title foreman is certainly a misnomer at the present moment when you consider there are so many people who hold the title and that the word foreman means *first man*. My suggestion in the paper might be taken up at some future date that we should eliminate from holding the title those unqualified to do so.

With regard to the third point, that with the growth of the works and the introduction of a new system, the works may be overstaffed for a time, that is a question for higher management. The firm grew, I think, from 30 or 40 people in that particular works to somewhere in the region of 500. I suppose the introduction of new executives was gone into, and it was considered that they justified their positions. I do not know if there is any plan laid down as to how many workers there should be before one can afford to have a certain number of higher executives, or whether a company can afford to have a planner and a rate-fixer. There seems no basis for that. But our point is not whether the extra executives were justified so much as the fact that these extra executives were elevated above the foreman.

MR. KIRKWOOD: I think we should remember that, taking the accepted basis of the word foreman and without attempting to define it more closely than Mr. Wright has done to-night, we can divide the men who are in that position, broadly speaking, into two classes. There is the first, the class where the men can be regarded more or less as a permanency, that is men of more mature years who have arrived at that position, and secondly, younger men who may only be passing through the position of foreman, and who will, in due course, arrive at higher executive positions. These two types are both necessary in any factory. The proportion is a matter for the product and the rate at which the factory is progressing. I am presuming that the factory is expanding, although it does not necessarily follow. If there is not a certain amount of turnover with the foremen, there is always the danger of stagnation. New men coming in give new ideas, and these new ideas can often be very beneficial in production. At this point I would like to stress the importance of training for foremanship. Mr. Wright has said

that leadership cannot be taught. Now, while I agree that you cannot get leadership out of books, I think all of us who have got into the position where we have people working to our instructions would admit, if we were honest, that when we were put into that position first we made mistakes. We were probably too much puffed up with our own importance and we trod on people's toes, and we were put right sometimes in a very unpleasant manner. We have all learned by our own mistakes. In the technical side of industry the student is not allowed to make such mistakes. He gets the opportunity of benefiting by the mistakes and the researches of those who have gone before, and if he is the proper type of man he bases his future technical knowledge on the knowledge that is already available. But leadership is something entirely different. Although there has been a number of books written on leadership I do not know of any classes that you can attend, and we all know that it is very much easier to learn from the spoken word than the written word, and I would suggest that there are no classes to teach men to control others because that, as Mr. Wright has mentioned, is one of the first essentials of foremanship. I think I am right in saying that both in America and on the Continent there have been certain moves in that direction, and I think it is something which should be copied in this country.

Then in regard to the training, I think it is very beneficial both from the foreman's point of view and the management's point of view if the broad outlook that has been emphasised can be cultivated by not stepping up a foreman directly from either the machine or the bench into a position of authority. It is very helpful if that man who has been singled out for promotion is taken out of his own section and, if possible, put round as many of the departments in the works as can be managed in order to give him an understanding of what is going on elsewhere. It is often lamentable to realise the ignorance that one section has of the section next door, and that ignorance is not due to the fault of the individual, it is due to the fault of the management in not giving the opportunities. If a potential foreman is given that period of training by going round the different departments, covering, if necessary, a period of years, he has accumulated a great deal of knowledge that he previously lacked. He has also come into contact with foremen and other executives, and all these men will have formed certain opinions of his ability, and that is a useful guide to the management before deciding actually to make him a foreman. If he gets a good report from the various sections then the management can go forward with a reasonable degree of assurance that that particular individual when he is put into a position of responsibility will prove an asset and not a liability. Where that method has been tried the results

have more than justified the disorganisation that some people might fear by doing it.

MR. GARVIE : With regard to the attempt to define the foreman and his position, let us think of the university. At one time it had about half a dozen professors. Gradually the university grew and grew, and you had more and more professors until there was a very large number of professors—and they are all still called professors. That is because specialisation is going on. Is it not the same thing in industry ? We are specializing, and therefore we must have specialisation. You set up a planning department, a rate-fixing department, an inspection department. Why not call the first man in that department "foreman planner," the "foreman inspector," and still satisfy Mr. Wright as keeping him the first man ?

Another point is the "disgruntled foreman." I think the disgruntled foreman has become disgruntled because something has been taken away from him which he thought was the very essence of his job, namely, telling the men what to do—not *how* to do it, but *what* to do. The foreman thought that was the most important thing, giving instructions, and because a good deal of that is taken from him he gets a little disgruntled, but I think in time that will pass, and the man in future doing the shop side of it will be called "shop foreman"—the first man in the shop. In that way we can retain what is wanted, that the foreman should be the first man.

MR. WRIGHT : I quite agree with Mr. Garvie. His instance about the professors and the university differs, of course, from our problem under discussion, because no one is asking the question "What is the position of the professor in the university ?" That is something which is known, but if the question were asked then perhaps someone would write a paper about it. But somebody is asking about the position of the foreman, and therefore we have to try to define it. The idea which Mr. Garvie put forward is quite a good one, that the title of the foreman might be retained for the first man in each branch of industry, and that might solve the situation, but it is not yet done.

MR. RUSSELL : Regarding the suggestion that the foreman might be called a section leader, it may be of interest to mention that the American phrase for the section leader is the "straw boss." The term originates from the straw votes they take prior to the presidential election in the States, the idea of the straw being to indicate how the tendency of the election is going. The expression "straw boss" infers that he is not a foreman, he is really an imitation of a foreman. I think Mr. Wright might to-night have created a feeling that we do not want to create particularly. I want to be a friend to the foreman, and the tendency Mr. Wright has set up to-night is that we should not be friends any more. We want to

co-operate, to co-operate with the foreman to produce a profit. That is our intention. I feel sometimes that there is just a little bit of this Lance-Corporal complex about the man who wants to be a foreman—he wants not to help in co-operation but sometimes, as it was very wisely said by someone to-night, to *tell* someone to do something. Now I think that is the wrong interpretation, the thing is wrong fundamentally, but it seems to me from some people I have met that that is the idea. However, my real point is to object to the line taken up about the planner and his very restricted clerical duties.

MR. WRIGHT : One can hardly write a paper of this sort without taking one side or the other. I could just as readily have taken the other side and written a paper asking "Who is this foreman who wants to have a place in the organisation?" I had to take some line of action, and as I told you at the beginning, I have taken the line which I thought might be most provocative, and apparently I have succeeded.

MR. BUCHANAN : There is one point about the training of the foreman which I think has been missed. The foreman ought to have a course of training in this planning department that we have had so much to say about, because I think that that is at the root of a good deal of the trouble. If the foreman realised just how things were done he would be more favourable towards the systems that are being used, and I think that with that training he would be a better foreman. I think one looks at things quite differently if one has only been a foreman. You do not go into detail the way you have to where planning is being done correctly. The foreman gives a job to somebody, and very often he gives it to somebody because that somebody is a good man, perhaps, on a centre lathe. That job could probably be done much cheaper on a combination turret lathe. But the foreman knows that he can give it to that man, and he will get it without bother—and it will take probably twice the time. It is points such as this which are studied in the planning department and which would add considerably to the ordinary foreman's education.

The second point I have to talk about is that Mr. Wright said that most of the work in planning was a matter of looking up books and fixing time from previously worked out records. Well, they must be worked out first, and to me it would seem ridiculous to go on calculating how long it took for a $\frac{3}{4}$ in. drill to go through a $\frac{3}{4}$ in. flange every time you have to drill a hole. We certainly work it out and get the time, and that is finished until you get a machine or tool which can do better and then you revise that time, but it certainly would be wrong not to make use of the good information you have. By using it you have more time to look into the more

difficult questions, so that the planner has available perhaps three quarters of his day for new investigations.

MR. WRIGHT : I quite agree that planning would be a good subject for the average foreman to study. I mentioned in my paper that there is 10% he needs in addition to leadership and commonsense. I mentioned books which would give him an idea of planning if he did not already know it. I still think that the average foreman knows as much about planning as is necessary, and sufficient to be able to discuss the subject with any ordinary planning man.

The second question was with regard to the use of information. I again agree that it is only right and proper to make use of the tabulated information. I have never said otherwise, but it seems to me that we have arrived at the point where most of the things that can be calculated have been calculated. During the transitional period from the old-time shop to the present-day it has been necessary to have people to plan and calculate and lay out the work. Now we have arrived at a time when most of that has been done, and I am prepared to say that most of the planner's work is finished so far as real planning is concerned except on a new job, something which has never been tackled before, and therefore at the present day it does devolve itself into a matter of clerical work. I am sorry if I am treading on the toes of the planners here tonight, but I still must insist that planning is substantially finished. During the last twenty-five years it has been going on at top speed and it is a sudden finish, but that is the reason why we have to look around and see what authority we have to allocate to the various individuals in the organisation. I suggest the planners should review the situation in the light of that knowledge and realise that their duties are not so important now as they were during the last twenty-five years.

MR. PLATT : The one thing I do not like about Mr. Wright's address has been the "disgruntled foreman." I think most of us are either foremen or have to deal with foreman. I do not think there are many disgruntled foremen. When a man takes the job of foreman in an organisation he generally knows before he takes it on—particularly if he is a promoted man—the position of the foreman in the organisation. I think it is essential to realise that the foreman's place in the organisation depends on the organisation, whatever it be—it is different in every organisation. I do not believe that there are two organisations that recognise the same position for a foreman, or for two foremen in the same organisation. But while the man knows his position there are other people who do not know his position in the organisation and, as Mr. Wright has said, these people by the fact that their position may be considered superior do overlap the foreman and take away much of his authority unnecessarily and not deliberately. The foreman I have had working for me have found that there has been nothing more irritating

to them, nothing more likely to put them off their work, than instructions coming from people who may have slightly greater authority in the organisation. It is a matter of courtesy at any rate that the foreman should be consulted and his advice asked, and there would probably be more satisfaction and less disgruntled foremen if such a course were taken. We find in many organisations that there are people who can give orders and have work carried out in a foreman's section without consulting the foreman, and this is done regularly and done by the best of fellows, and that is one reason we get disgruntled foremen, in my opinion. My principal point is that the foreman's place in the organisation is defined in that organisation, and cannot be altered by our Institution.

MR. McMASTER : The fact was mentioned that planners at the end of twenty-five years were going out of existence, that they were dying. You may remember that planners are more wanted to-day than they were yesterday. Why is that the fact? Simply because the planner is coming into a more prominent position than, shall I say, the disgruntled foreman, owing to the fact that he has had the practical experience to get that position as a planner where he can put down his practical experience on paper and produce it to a foreman who happens to be in the shop to put it into operation. The point was mentioned also that where the firm was building up they brought in technicians from outside as intermediates. These technicians ought to have some practical experience which they can put on paper. Where do they get the practical experience? In the shop? In my opinion a planner to-day is every bit as important as the foreman in the shop, so much so that he has still another twenty-five years ahead of him, doing more useful work. After all, production methods of to-day have not yet reached finality to be put on a system card to be repeated to-morrow.

MR. WRIGHT : Again I can only try to clarify the situation in regard to these planners. I do not mean to say that they should go out of existence. I have no doubt they will still be required: they have become part of the scheme of things. Organisation now is looked upon as being too big to be dealt with in any other way than to plan the work for the shops. It is their importance or the authority that they assume in an organisation that I am trying to make a point of. During the last twenty-five years they have undoubtedly been very important people, and they have done some very fine things, but now from onwards and for the next twenty-five years and probably fifty years they will do routine work, and I would like to see them assume the position to which they are entitled. They should not be the cause of higher management diverting their attention from the workshop and the foreman into other channels. That is my point. It is not the fact that planners in future will not be required. It is the fact that I think their import-

ance will be diminished as time goes on and they will become part of a routine.

MR. LANG : I think we owe Mr. Wright a very special vote of thanks to-night. It is very obvious that if he may not have satisfied everyone of the exact status of a foreman he has certainly put a great deal of thought and, I might say, work and study into his paper. If that exact status has not developed there is one thing that has developed and that is that next year we ought to have a paper from one of our members on the status of the planner. I rather disagree with Mr. Wright in some of his percentages. Mr. Kirkwood made a point which I agree with—I think there should be quite a considerable proportion of the training period of the foreman out with his own department. I can think of a works I know where there are five machine foremen and at least three, possibly four, of these machine foremen are fitters. I think that not only should the foreman know his particular product, how to make it, but that he should also know what it is and how it is going to be used. I think that it is very helpful, and I think perhaps, Mr. Wright, you might allow 5% at least for experience outwith his department. I ask you now, gentlemen, to accord to Mr. Wright a very hearty vote of thanks for his most interesting paper and also for the friendly discussion.

FIFTEENTH ANNUAL DINNER

(NOTE.—As the Sixteenth Annual Dinner fixed for 20th October, 1939, has had to be postponed owing to the war, an extended report of the proceedings at the Fifteenth Annual Dinner is now given, supplementary to the earlier report already published).

THE Fifteenth Annual Dinner of the Institution was held at the Dorchester Hotel, Park Lane, London, on Friday, October 21, 1938. The Rt. Hon. Viscount Nuffield, O.B.E., M.A., D.C.L., President, was in the chair. The attendance numbered over 500.

On the President's right were : The Rt. Hon. Sir Kingsley Wood, M.P. (*Secretary of State for Air*), The Rt. Hon. Lord Austin (*Past-President*), Dr. A. P. M. Fleming, C.B.E. (*President, Institution of Electrical Engineers*), Mr. J. G. Young (*Chairman of Council*), Mr. C. W. Whitham, C.B.E. (*Director of Industrial Planning, War Office*), Mr. C. N. McLaren (*Director of Ordnance Factories*), Mr. O. Boden, O.B.E. (*Deputy Chairman, Morris Motors*), Mr. C. J. Bartlett (*Managing Director, Vauxhall Motors*), Mr. T. Fraser (*Past-Chairman of Council*), Mr. G. E. Bailey (*Director and General Manager of Works, Metropolitan Vickers*), Mr. C. le Maistre, C.B.E. (*Director, British Standards Institution*), Mr. H. C. Armitage (*Past-Member of Council*), Mr. H. S. Syrett, C.B.E. (*Legal Adviser to the Institution*), Mr. J. C. N. Hughes (*Messrs. T. G. Scott & Son*), Mr. I. W. Chubb (*Editor "Machinist,"* and Mr. S. Carlton Smith (*Past-Chairman of Council*). On the President's left were : The Rt. Hon. Lord Sempill (*Deputy-President*), Mr. S. B. Donkin (*President, Inst. of Civil Engineers*), Mr. Tom Thornycroft (*Past-President*), Mr. A. H. R. Fedden (*President, Royal Aeronautical Society*), Mr. J. D. Scaife (*Past-President*), Lt.-Col. H. A. P. Disney (*Air Ministry*), Mr. G. Russell (*President, Inst. Cost and Works Accountants*), Dr. F. T. Chapman (*H.M. Inspector, Board of Education*), Mr. J. H. Bingham (*Late Chairman of Council*), Mr. G. A. Robinson (*Principal, S. E. London Tech. Inst.*), Mr. C. Edgar Allen (*Editor, "Machinery"*), Major J. Cosgrove, Mr. T. White (*Past-President, Glasgow Section*), Mr. F. E. Robinson, O.B.E., Mr. A. H. Hall, C.B., C.B.E., and Mr. W. Puckey (*Member of Council*). Other Section Presidents sitting with groups of members of their respective Sections were : Messrs. W. H. Denny (*Southern*), W. H. Fidler (*Sheffield*), B. C. Jenkins (*Luton*), N. V. Kipping (*London*), J. B. Lang (*Glasgow*), A. Leggett (*Eastern Counties*), F. A. Pucknell (*Manchester*), R. D. G. Ryder (*Preston*), and J. R. Sinclair (*Coventry*).

In addition to the above, many distinguished visitors were present as guests of members, including eight members of the Canadian Air Mission at present in this country.



"By courtesy of 'Machinery' "

FIFTENTH ANNUAL DINNER, DORCHESTER HOTEL, LONDON.

The toasts of "The King" and "The Queen, Queen Mary, and the other Members of the Royal Family" were proposed by the President and duly honoured.

The RIGHT HON. SIR KINGSLEY WOOD, M.P., Secretary of State for Air, in proposing the toast of "The Institution," said: Lord Nuffield, My Lords and Gentlemen, I am very gratified to-night to have the opportunity of addressing this great gathering, which particularly impresses me, not only so far as its influential character is concerned, but because I see so many young men before me upon whom the future of this country in very many respects will rest. I would like first to express, Lord Nuffield, the indebtedness of the Government to Production Engineers for the assistance which they have given us. We have been passing through difficult and anxious times, and whilst there are people who say that this should have been done, or this should not have been done, I have been trying myself to look round and see what is the best we have obtained from the events of those last few critical weeks, and I would say that one good thing is that the British nation has shown that it has the same determination, the same fibre and qualities that former generations possessed. I would like to thank you and your Institution to-night for the many offers of service we received during those recent days. I hope myself, and I am sure you will agree with me, that the spirit of service which was exemplified during the last few weeks will not be dissipated or dispelled so far as the nation is concerned. We feel certain, gentlemen, that all those voluntary efforts and offers which were made are still available to the nation in a way which will produce, if it is necessary, national service in an efficient and orderly form.

I would also like to say this to you to-night, speaking as Secretary of State for Air and occupying a very responsible position at this time, that I realise whilst we have to continue the efforts which the Prime Minister began, we have got to make many more efforts to expand and to intensify all we are doing on behalf of the defences of this country. I am not one of those, Lord Nuffield—and I am sure you are not one—who would decry the efforts that have already been made, but I do not hesitate to say to you that whilst much has been done, much remains to be done. Gentlemen, it is the menace of the air—this new and sudden and powerful means of assault—that is the main cause of unrest and uncertainty in the world to-day, and I am glad to say, because many of you are associated with it, that many successful efforts are being made in that particular connection.

I have met here this evening many friends of mine who are associated with the aircraft industry. I can testify, gentlemen, that that industry is engaged in unparalleled efforts in increasing aircraft production in this country, but it is clear to me that the considerable requirements of the air force demand the utilisation of more and

more of our engineering resources if we are to produce the aircraft which we need in increasing numbers for the purposes of our national defence. I would like to assure you that we are not only intensifying the policy of utilising the resources of the smaller firms, but I am glad to see on both sides of me the two leaders of the great resources which are available to this country in the organisations of Lord Nuffield and Lord Austin.

We have got to broaden our basis of aircraft production as we are doing by availing ourselves of organisations outside the aircraft industry, which possess important technical staffs, including Production Engineers of wide experience and first class ability, and if anybody asked me whether this country was not capable of the effort needed to meet any necessity which may arise, I would reply that there is indeed no lack of first-rate industrial capacity available for our defence work. Sometimes people say: "What about labour and labour forces?" Well, I am glad to assure you that labour forces are being increased, and I do not hesitate also to say that more will be required.

I often think, Lord Nuffield, and I am sure you must do the same with all your experience, of some comparisons which are made as to the production of aircraft during the last war and to-day. I do not think it is always realised that at the end of the war of 1914-18 the total number of man-hours involved in making an aeroplane used in service at that time was in the region of some 2,000. Lord Nuffield knows, and so does Lord Austin, that our latest type of machine requires anything from 20,000 to 80,000 man-hours, which shows the difficulty and the complexity of the problem which faces us.

I am particularly glad to propose this toast, because a good deal rests upon you. It has been well said that a good engineer—and this certainly applies to the Production Engineer—is a man who can produce two blades of grass where only one grew before, or, to put it in another way, who can produce an article at half the normal cost. Certainly, gentlemen, in the development of industrial processes the Production Engineer has played a very important part in devising methods and designing tools which make it possible for one man with this equipment to do the work of many. I have been more and more impressed since I have held my present office that this is particularly important in connection with the production of aircraft. The design of aircraft has during the last few years undergone a considerable change. The old type of composite construction of wood and metal has given way to one entirely of metal construction. It has involved new technique, the training of large numbers of men, and in this connection the Production Engineer has been called in to design special jigs and tools to facilitate production.

I believe, Lord Nuffield, that one of the greatest contributions that could be made at the present time on the part of the Production Engineer, both from the point of view of speed and finance, would be to devise new and improved methods of manufacturing aircraft, and I would suggest myself that a great deal could be achieved by closer contact between Designers and Production Engineers to simplify—what a blessed word that would be to the Air Ministry!—to simplify the many processes involved in the manufacture of modern aircraft.

I think we must all agree with the policy which we are adopting at the present time of taking aircraft work to the men rather than taking men to the aircraft work. It is, I find, comparatively easy to build a new factory, but the heart of a factory consists of the managers, the workpeople, and not least the technicians and engineers, working as a team to produce results. To attract labour to a new factory in many cases takes a considerable amount of time, and we are therefore expanding the policy of taking the work to where the labour and technical ability exist. This has many advantages. It reduces the housing problem, the transport problem, and in many cases the necessity for men to move from their homes, and I hope that in this respect you will agree that we are moving in the right direction.

I would only like to say in conclusion, Lord Nuffield, that with this body of men here to-night, with whom I am so glad to be associated, lies a great deal of the future of this country. At one time the Production Engineer, I suppose, was looked upon as of little or no account. I am glad to think that to-day he has come into his own, and for my part, although I have had the pleasure of proposing many toasts during the last few years, none has given me such gratification and pleasure, Lord Nuffield, as proposing the toast of the "Institution of Production Engineers."

It is a great pleasure to me, Lord Nuffield, to couple your name with this toast. When history comes to be written perhaps somebody will describe my relations with you when first I became Secretary of State for Air. When I was called to this important office, gentlemen, one of the greatest encouragements and helps was Lord Nuffield. When I made an appeal on national grounds to him he was the first to respond, and respond gladly, to that appeal. I hope Lord Nuffield will not mind me saying that his name stands not only in this country, but throughout the world for generosity, enterprise, and straightforward dealing. It is a particular pleasure to me, Lord Nuffield, to have this opportunity of proposing this toast and coupling your name with it. As long as we have men like you we need not be afraid of the future of this country. We are sometimes too inclined to be pessimistic and belittle our own efforts. It is a failing—perhaps not a bad one—but I feel that as

long as we have leaders in the industrial field such as Lord Nuffield and Lord Austin, backed by the finest body of workers that any country could desire, we can go forward with courage and determination, believing that the old country has still a good deal of life and vigour in it. It is for all those reasons, Lord Nuffield, that I ask our friends here to-night to rise and drink to the toast of "The Institution of Production Engineers," coupled with your name as its President.

THE RIGHT HON. VISCOUNT NUFFIELD, President, replying to the toast, said: My Lords, and Gentlemen, I think we have had a little encouragement—a lot of encouragement—from Sir Kingsley Wood to-night. May I say that had we had that encouragement three years ago we would have been in a better position to-day? When I look over the past two or three years and think what might have been done, it is literally appalling, but we are here to-night ready to do what Sir Kingsley Wood is asking us to do—to get on with the job. So, with that, we won't talk any more of the past. However, I cannot let this occasion pass without giving the greatest praise to our Prime Minister for what he has done.

I feel to-night that I am speaking to men of my own heart, and I want to emphasise one point. We have at this table to-night Lord Austin, who, like myself, started from a small beginning. Speaking here to-night to a lot of much younger men, I want them to feel that there is a place in this world still for the men who will just get up and get on with the job.

In the past we have been asked to produce aeroplanes out of our sleeves like butterflies, but first of all we would like an order for a decent number of machines. I have no fear that anyone concerned with production will disagree with me. You cannot begin big production unless you have a decent order to start with. That is what they have asked us to do in the past. Sir Kingsley Wood is at any rate trying to break down that barrier, and I am sure he has broken down a tremendous amount of red tape already. I have not the slightest doubt that if that goes on for at any rate a reasonable amount of time we will give this country all it wants in the air. But as you Production Engineers understand, these things cannot be done in five minutes. Had it been done two or three years ago we might have been in an entirely different position now.

I do not know of any other country which could produce better young men coming forward ready to do the job that we are asking them to do, I am hoping that this Institution of which I have the honour to be President will go on improving in numbers, efficiency, and in usefulness. Before sitting down I would like to thank our late President, Lord Sempill, for the great support he has given me during my period of office. He is working very hard for our Insti-

THE INSTITUTION OF PRODUCTION ENGINEERS

tution which includes in its ranks so many of the men that we are looking to for providing the arms we will require in the future.

The President announced the Awards for the past Session, and presented these to the recipients who were present. The Awards were :—

Medal for the Best Paper by a Member : To Mr. R. Kirchner, A.M.I.P.E., London Section, for his paper on "Press Tools."

Medal for the Best Paper by a Non-Member : To Dr. George Schlesinger for his paper on "Practical Research in Production Engineering."

Medal for the Best Paper by a Graduate (Hutchinson Memorial) : To Mr. G. A. Wood, Grad.I.P.E., for his paper on "Costing and Estimating."

The Lord Austin Prize : To Mr. B. M. Mason, Grad.I.P.E., for his attainments at the latest Graduateship Examination.

THE RIGHT HON. LORD AUSTIN, K.B.E., LL.D., J.P., Past-President, proposing the toast of "The Visitors," said : My Lord President, my Lords, Gentlemen, it is a great pleasure to me to give the toast of "The Visitors." On this occasion they are such a distinguished company that I am spared the necessity of looking up books of reference. Their records in various spheres of endeavour are well known to us all. It is a great satisfaction to welcome here the Secretary of State for Air, Sir Kingsley Wood. The Institution of Production Engineers is not an old-established body. It has still a number of years to go before it has reached its majority. Nevertheless, I think I may say there is every indication of the respect in which the Institution is already held and the important role it plays in the industrial activities of the country. This Institution is young, but it is full of the energy and enthusiasm of youth, and I am sure that industry will gain through its work. To our chief guest, Sir Kingsley, the word "production" must be almost a nightmare. But ever since he came into his present office the demand for production and more production has been insistent.

I do not wish to deal with the political situation, but I may make mention of it in this way : the future of our country will depend very largely on the successful efforts of the Production Engineers of Great Britain and France. They should be provided, as our President has already mentioned, with instructions to proceed, and I have no doubt our chief guest has this matter in hand. In the coming months the resources of industry are going to be taxed to the utmost, for it has been made very obvious in the past few weeks that the British public are determined to make Britain and the Empire strong. On Sir Kingsley's shoulders will this great problem bear most heavily, but I have no doubt they are equal to the burden. His achievements in other ministerial posts have already proved

FIFTEENTH ANNUAL DINNER

that. During the trying periods that lie ahead he will have all the assistance that Production Engineers can give him.

Gentlemen, the list of visitors is so long and so distinguished that it would be impossible in the time at my disposal to mention individually all those who have honoured us this evening with their presence; but on behalf of the Institution I wish to assure them that our pleasure in inviting them is very sincere.

It must be most gratifying to my friend the President, Viscount Nuffield, as it is to us all, to have at this gathering so many Presidents of other Engineering Institutions—Electrical, Civil, Aeronautical, Automobile, are all represented, as is the Institute of Cost and Works Accountants.

Many other friends I also see around me—Mr. Boden, Deputy-Chairman of Morris Motors, Mr. Bailey, of Metropolitan-Vickers, Mr. Bartlett, of Vauxhall Motors. In addition we have with us to-night eight Production Engineers from the Dominion of Canada, who form part of a Mission from that country concerned with the production of aircraft in Canada. We welcome Mr. Sands and his friends, and also Squadron-Leader Heath, of the Royal Canadian Air Force. A friend of mine suggested to me a day or two ago that it would be worth while proposing to the Government that they might with advantage spend £100,000,000 in Canada in the production of aircraft and in the training of pilots.

Dr. Chapman, of the Board of Education, is here, and that reminds me of the question of the National Certificate. You will be pleased to know that our conversations with the Board of Education on the subject are definitely hopeful. We believe that we may be able to get a Certificate. We are trying very hard, and if you do not try you will not get anything.

We are sorry, gentlemen, that owing to another engagement the President of the Institution of Mechanical Engineers is unable to be here. I am sure he would have told us something about the interest which his Institution is taking in our proposed research scheme. In May last our Council invited the Institution of Mechanical Engineers to participate in that scheme, and as a result three members of its Council were appointed to examine the plan with us. I think I can say that providing we get this scheme put through it will add very largely to the prestige of our Institution. The award of the Institution's medal for the best paper by a non-member during the last session went to Dr. Schlesinger for his paper on "Practical Research in Production Engineering," given before three of our leading sections, London, Manchester, and Birmingham.

Many disturbing influences have been at work since we met here a year ago. International affairs have caused us anxious moments. I think the country has learnt its lesson, and if the crisis has served no other purpose than to disturb the complacency of our legislators

it will have been a good thing. It is not the time or place to apportion blame for the country's very humiliating position. We can only work so that the years that lie ahead of us may see this Empire of ours again taking its rightful place and exerting its proper share of influence. Might I ask Sir Kingsley Wood at the first convenient opportunity to convey to the Prime Minister the assurances of the whole-hearted co-operation of the members of this Institution, whose services will play such a very important part in any defence programme?

Gentlemen, I would ask you now to rise and drink to the health, success and happiness of "Our Visitors," coupled with the name of the President of the Institution of Electrical Engineers, Dr. Fleming.

DR. A. P. M. FLEMING, C.B.E., President of the Institution of Electrical Engineers, responding to the toast, said: My Lord President, Lord Austin, My Lords, and Gentlemen, I wish to thank you, Sir, on behalf of the many guests who are here for the very kind way in which you addressed us, and all the members of the Institution of Production Engineers for the very cordial way in which they received the toast.

We are living in troubled days, and are faced with a very strenuous time. I suppose on an occasion like this it gives us just a respite—a very brief respite—which enables us to take stock of ourselves.

Your Institution, in common with other great Institutions, comprises within the experience of its members a great fund of knowledge. That fund of knowledge is well recognised in our everyday industrial existence, and, as has already been said, it will be of incalculable value in time of national emergency. It is one of the responsibilities of the great Technical Institutions to exchange experience and knowledge among their members. It is a co-operative—a voluntary co-operative—scheme, and it is a scheme which encourages, particularly among the younger men, the spirit of initiative and enterprise; and to show that this actually is the case you have seen members come forward to receive their awards because they have shown that enterprise. It is not sufficient in an Institution merely to exchange experience. It is important, and of growing importance, to give every means of increasing and expanding that knowledge so that it can be turned to the speediest commercial and industrial account.

Having regard to the national conditions that we have to face, and having regard also to the fact that we must preserve at all costs our position in the industrial world in competition with other nations, there has been no time in our history when it was more necessary to expand rapidly our production, to make it more flexible, to make it more economic.

There are two basic factors which you recognise in your Institution—they have regard to personnel and research. Both of these

subjects have been touched on to-night. I would like to refer to them a little further.

We in industry are accustomed to expend money on machine tools—sometimes very expensive machine tools—and we very soon begin to write off some of their value in depreciation. This has not always been the case, and we have realised that on the personnel side, particularly with a young industry, we have an asset which has an appreciating value. We foster their development, encourage their growth. We appreciate them continually, and I am glad to think that in your Institution you recognise that fact and have already devoted a great deal of time to the study of the interests of the young members of the industry. You have heard from your President to-night his views on the possibilities that are opening out before the young men. That is very important, gentlemen, and I assure you from a good deal of study of this problem in different parts of the world that here in this country we recognise the young man and are prepared to foster his growth and encourage his promotion, to provide him with opportunities to wherever his abilities and his courage may lead him. We are prepared to let him carry through what he starts. That is very different from many other countries. One continental country which we know very well has a number of very clear views. A man can get into one strata and he can go as far as he will there, but his chances of going higher are practically nil. We foster the good in a man who exercises individual initiative and resource as a priceless asset which is of advantage and will ultimately help the nation as a whole.

Lord Austin spoke of the question of research. I have had experience of a quarter of a century in directing research activities, and I can speak highly of the great benefit that will arise from research. I do not need to say anything about that to enlightened Production Engineers. They know all about that, but there is one aspect of research that perhaps is not so clearly defined, and that is the research that comes from co-operation. As individuals we are rather disposed to be reluctant to put our experiences into the pool of common knowledge, and moreover we are reluctant to put the knowledge of our failures, equally important, in that pool—the knowledge that serves for guidance in the future. Now it is my belief that we should be alive to this question of pooling our knowledge when we have common problems. That knowledge will form the starting point for the employment of resources to expand it and apply it to the benefit of the whole industry.

I was particularly glad to hear of the proposal to conduct co-operative research among the members of your Institution into the uses and improvements in connection with the application of machine tools and machining methods and problems, and I can think of no more fruitful and no more valuable field in research, because it

covers such an enormous area. It has such an enormous application that I am sure it will improve tremendously the efficiency and quality of production.

A few years ago a prominent industrialist said that the greatest assets possessed by his men were the things they did not know. That is a paradoxical statement signifying that his organisation was well equipped and was able to deal with research to develop new discoveries from research, which would in turn be utilised. Now that is the proverbial method of keeping a progressive concern in the foreground, and it is out of the things we do not know that will arise those abstract ideas which, by research and by application of engineering, will be brought to a commercial fund of good.

Gentlemen, your Institution has grown greatly in seventeen years. You have, I believe, now 20 different centres. That is a very noble achievement. In thanking you again for your hospitality to us to-night I would voice what I am sure is the feeling of all your guests, the hope that your Institution will go on from strength to strength.

THE RIGHT HON. LORD SEMPILL, A.F.C., Deputy-President and Immediate Past-President, in proposing the toast of "The President," said: My Lord President, My Lords and Gentlemen: A year ago the honour fell to me of proposing the health of the then newly elected President, Lord Nuffield. At that time, as the retiring President, I had certain privileges and could say about my successor exactly what I thought. Now there are difficulties. Lord Nuffield considers that I should have said nothing at all, and he will reprimand me if I say anything about him to-night. This I can say, however, that all of us can redouble our efforts to do more and more for the Institution. We can show our appreciation for all Lord Nuffield has done for us by redoubling our efforts and pushing forward the work with increasing energy. Under his pioneering spirit and his capacity for leadership the Institution has shown a record growth during the year he has held office. I am very glad to be able to tell you that Lord Nuffield has agreed to continue as our President and to lead us forward for another year.

A great deal of work has been started by our President during the past year. I will mention two points only. One is the question of a National Certificate in Production Engineering. We believe in the necessity of having a National Certificate in Production Engineering, and the conferences we have had with the President of the Board of Education and with some of his officials, particularly Dr. Chapman, who is present here to-night, give us great confidence in the future. We have every belief that we shall be able to make good the case we have already laid before the authorities in respect

FIFTEENTH ANNUAL DINNER

of this matter. Secondly, too, in regard to the research scheme already referred to—that is a matter which is going ahead.

Gentlemen, I am going to ask an old friend of all of us, one of the earliest Presidents of the Institution, Mr. Tom Thorneycroft, to say one or two words, and to give him the privilege of putting the toast of "Lord Nuffield" to you.

MR. TOM THORNYCROFT, Past-President, in supporting the toast, said: My Lord President, My Lords and Gentlemen: It is a very great pleasure and a great honour to be allowed to join my name with my old friend Lord Sempill in this toast. I am delighted to be able to say a few words, because, having seen the early days of this Institution, and having felt the need of it in spite of a great many people having said it was unnecessary, I feel very strongly that the Production Engineer has not been given his fair chance in the world until now. He is definitely a product of modern times. We have now laid down a policy—and I am delighted to hear our Minister for Air say we have one—and Production Engineers must help with the expanding and carrying out of that policy. We have not planned our organizations in the past in a proper way. If we now give the Production Engineer his proper place things will be different. We have a marvellous leader in Lord Nuffield. Led by people like Lord Nuffield, if we have a definite policy, and it is properly planned and carried out, I believe sincerely that we shall be able to hold our own in the world. I offer you the toast, gentlemen, of "The President," Lord Nuffield.

VISCOUNT NUFFIELD, in responding to the toast, said: I thank you for the many kind things you have said about me to-night, but the only thing that matters is the old country. In responding to the toast I would first of all like to say that there is a lot of room at the top. I have heard during the past few years that the boy of to-day does not stand a chance. You can believe me to-night, gentlemen, there never was such a time for any of you younger men to get through and get to the top. I want everyone here to realise that, because our trouble is to find a big man to do the job, and we cannot find him fast enough. I have many good men—Lord Austin has many good men—but we have not enough of those men, and we cannot find them.

Will some of the young men in this country to-day just push themselves through sufficiently so that we can just see the tops of their heads? I will agree that the average man's life is covered by routine jobs. But that is only because he is not pushing hard enough. I am not suggesting that he should be aggressive, because that is the one thing that is not good. You will believe me that we can use these men as quickly as they appear.

Now, gentlemen, it has been rightly stated on several occasions when I have been master of ceremonies, as to-night, that we should

push forward this Institution of ours. We have at the present time a chance of securing the services of Dr. Schlesinger for our research work, and I would like to help in doing that. He has made, I suppose, as deep a study of machine tools as any living man, and this, I am sure, will react to our advantage. Anyway, I have been thinking quite a lot this evening, and I shall have pleasure in supporting this Institution and its research plans and aiding it to bring Dr. Schlesinger into our Institution. For this purpose I am willing to give £25,000. If I may say so, we are always pleased to appreciate the abilities of any man from any part of the world, and I think it is one of the reasons we are such a great nation.

It is my greatest hope and my pleasure to think that Dr. Schlesinger will be able to help us to improve our methods by means of research in production. I am not suggesting that any other country can teach us much, but there may be people who can teach us just a little bit more, and that is exactly what we want to learn.

Gentlemen, if I may say so, this country has at any rate always been liberal and tried to be international, and I feel that if a man of international reputation on research work such as our Institution has in mind is available, we ought to secure his services. I feel that what I am doing will be of great help to this Institution, and that it will enable it to proceed with its research plans without further delay.

MR. JAMES G. YOUNG, Chairman of Council, then rose and said : My Lord President, My Lords and Gentlemen. As Chairman of the Council of the Institution, I thank you, Lord Nuffield, most heartily on behalf of all our members for the very handsome tribute you have paid to us and for your magnificent gift this evening. We welcome always the best men at the top. We hope that the members of the Institution have done, and will continue to do, their bit in uplifting the country and making it strong. Believe me, Lord Nuffield, Lord Sempill and Lord Austin, we appreciate the work you have done for this Institution. The splendid gift to the Institution which our President has just announced will enable us to proceed at once with our research plans. I believe that the result will prove to be of the greatest advantage to the science of production engineering and to the welfare of our engineering industries.

During the evening a musical programme, under the direction of Mr. Victor Marmont, was given by the following artistes : Mr. Tom Kinniburgh, *Bass* ; Mr. Rupert Hazell and Miss Elsie Day, *Entertainers* ; Mr. Marmont, *at the Piano*.

